CLAIMS

What is claimed is:

1.   A method for processing access channel signals in a digital wireless communication system comprising the steps of:

    5   at a transmitter,

encoding pilot symbols in a preamble portion of an access channel frame of information to be transmitted on the access channel; and

encoding data symbols in a payload portion of the access channel frame, the payload portion of the access channel frame also including pilot symbols

    10   interleaved with the data symbols.

2.   A method as in Claim 1 additionally comprising the steps of,

at a receiver,

obtaining a pilot symbol phase estimate by feeding the pilot symbols in the preamble portion to a pilot correlation filter;

    15   obtaining a data symbol estimate by feeding the data symbols in the payload portion to a data symbol correlator; and

using the pilot symbol phase estimate provided by the pilot correlation filter to synchronize detection of the data symbols.

    20 3.   A method as in Claim 2 additionally comprising the steps of, at a receiver:

extracting pilot symbols from the payload portion; and

performing a cross product operation with the pilot symbols embedded in the payload portion and the data symbols.

4.   A method as in Claim 2 additionally comprising the steps of, at the receiver,

    25   extracting pilot symbols from the payload portion; and

performing a cross product operation between the pilot symbols
embedded in the payload portion and the data symbols output by the data symbol
correlator.

5.   A method as in Claim 1 wherein the pilot symbols are interspersed at regular
intervals in the payload portion.

6.   A method as in Claim 2 wherein the transmitter is located at a base station, and
the receiver is located at one of a plurality of field units serviced by the base
station at the same time.

7.   A method as in Claim 2 additionally comprising the steps of:
    detecting the pilot symbols in the preamble portion with a pilot
correlation matched filter having a transfer function matched to the pilot
symbols.

8.   A method as in Claim 2 additionally comprising the steps of:
    detecting the data symbols in the payload portion with a data correlation
matched filter having a transfer characteristic matched to the data symbols.

9.   A method as in Claim 2 additionally comprising the steps of:
    operating a pair of pilot correlation matched filters to detect the pilot
symbols in the preamble portion, the pilot correlation matched filters operating
in ping pong such that one of the pilot correlation matched filters is processing a
received signal while the other is loading filler coefficients.

10.   A method as in Claim 2 additionally comprising the steps of:
    receiving a payload portion sequence of pilot symbols and data symbols;
    separating the payload portion sequence into pilot symbols and data

symbols using synchronization information derived from the pilot symbols in the preamble portion; and

    comparing the separated pilot symbols and data symbols to detect information received.

5   11.   A method as in Claim 10 wherein the step of comparing the separated pilot symbols and data symbols comprises performing a dot product of the separated pilot symbols and data symbols.

    12.   A method as in Claim 2 additionally comprising the step of, at the receiver,

    feeding a received preamble portion to a pilot correlation matched filter;

10   and

    comparing the output of the correlation matched filter to a peak detector.

    13.   A method as in Claim 12 additionally comprising the step of:

    determining a time position of a plurality of peaks in the peak detector output; and

15   setting a plurality of rake receivers to each of the detected peaks.